WE CLAIM:

1. A brake apparatus comprising:

brake means including a drive motor having a shaft that is rotatable about an axis for actuation of the brake means; and

jaw-tooth clutch means for selectively locking the shaft against rotation about the axis.

2. The apparatus of claim 1 wherein:

the drive motor includes a housing disposed about the shaft; and

the jaw-tooth clutch means includes a rotating jaw operatively attached to the shaft for rotation about the axis, and a translating jaw operatively connected to the housing for non-rotatable translation along the axis and into engagement with the rotating jaw, the rotating and translating jaws each having axially directed mating teeth affixed on mating surfaces of the jaws, the jaw-tooth clutch thereby locking the shaft against rotation about the axis.

3. The apparatus of claim 2 wherein the teeth on the translating jaw are configured such that they can be sheared off by the drive motor following an inadvertent engagement of the jaw-tooth clutch, to thereby provide means for actuating the brake means should the jaw tooth clutch means malfunction.

4. The apparatus of claim 2 further including means for moving the translating jaw along the axis for selectively engaging and disengaging the mating teeth of the jaws of the jaw-tooth clutch.

5. The apparatus of claim 4 wherein:

the means for moving the translating jaw along the axis includes a cam shaft disposed about the shaft of the drive motor and rotatable independently thereof about the axis, the cam shaft having on an outer periphery thereof a cam surface; and

the translating jaw includes a bore therein configured for passage therethrough of the cam shaft, the bore defining a ramp surface configured for mating engagement with the cam surface of the cam shaft,

the cam surface and ramp surface being cooperatively configured such that rotation of the cam shaft in a first direction about the axis causes the cam surface to engage the ramp surface and drive the translating jaw away from the rotating jaw, and rotation of the camshaft in a second direction about the axis causes the cam surface to disengage from driving engagement with the ramp surface, thereby allowing the translating jaw to move toward the rotatable jaw.

6. The apparatus of claim 5 further including spring means for biasing the translating jaw toward engagement with the rotating jaw of the jaw-tooth clutch.

7. The apparatus of claim 6 wherein the spring means provides a preload for maintaining engagement of the clutch means following engagement of the jaw-tooth clutch.

8. The apparatus of claim 5 further including means for rotating the cam shaft in a first and a second direction about the axis.

9. The apparatus of claim 8 wherein the means for rotating the cam shaft includes means for manually rotating the cam shaft.

10. The apparatus of claim 8 wherein the means for rotating the cam shaft about the axis includes lever means having a hub thereof attached to the cam shaft and an arm extending radially outward from the hub to a distal end of the lever adapted for application of a force for rotating the hub of the lever means and the cam shaft in a first and a second direction about the axis.

11. The apparatus of claim 10 further including compression spring means disposed between the translating jaw and the lever means.

12. The apparatus of claim 8 wherein the means for rotating the cam shaft includes a clutch actuation motor operatively attached to the cam shaft by clutch drive means for rotating the cam shaft in the first and second directions about the axis.

13. The apparatus of claim 12 wherein:

the clutch actuation motor includes a shaft extending therefrom and rotatable about a second axis; and

the clutch drive means includes gear teeth operatively extending from the cam shaft, and a pinion affixed to the clutch actuation motor shaft, the pinion having gear teeth in mating engagement with the gear teeth extending from the cam shaft such that rotation of the shaft of the clutch actuation motor about the second axis rotates the cam shaft about the first axis, to thereby selectively engage and disengage the jaw-tooth clutch.

14. The apparatus of claim 13 wherein the second axis and the axis of drive motor are substantially parallel.

15. The apparatus of claim 13 wherein the clutch drive means includes a sector gear having a hub for attachment to the cam shaft and a web extending radially outward from the hub to a rim having the gear teeth extending therefrom for engagement with the pinion.

16. The apparatus of claim 15 further including compression spring means disposed between the translating jaw of the jaw-tooth clutch and the sector gear.

17. The apparatus of claim 15 further including means for attaching a manual release cable mechanism to the sector gear for rotating the sector gear about the axis to release the jaw-tooth clutch.

18. A brake apparatus comprising:

brake means including a drive motor adapted for receiving power from a first power source and having a shaft that is rotatable about an axis for actuation of the brake means;

jaw-tooth clutch means for selectively locking the shaft against rotation about the axis; and

a clutch actuation motor adapted for receiving power from a second power source independent from the first power source, and operatively connected to the jaw tooth clutch means for driving the jaw-tooth clutch means for selectively locking the shaft against rotation about the axis.

19. The apparatus of claim 18 wherein:

the drive motor includes a housing disposed about the shaft; and

the jaw-tooth clutch means includes a rotating jaw operatively attached to the shaft for rotation about the axis, and a translating jaw operatively connected to the housing for non-rotatable translation along the axis and into engagement with the rotating jaw, the rotating and translating jaws each having axially directed mating teeth affixed on mating surfaces of the jaws, the jaw-tooth clutch thereby locking the shaft against rotation about the axis.

20. The brake apparatus of claim 19 further comprising means for manually unlocking the jaw-tooth clutch.

21. A method for operating a brake apparatus including a drive motor adapted for receiving power from a first power source, having a shaft that is rotatable about an axis for actuation of the brake apparatus and a housing disposed about the shaft; the method comprising:

operatively attaching a rotating jaw of a jaw-tooth clutch to the shaft for rotation about the axis;

operatively connecting a translating jaw of the jaw-tooth clutch to the housing for non-rotatable translation along the axis and into engagement with the rotating jaw, the rotating and translating jaws each having axially directed mating teeth affixed on mating surfaces of the jaws;

rotating the shaft of the drive motor for engaging the brake apparatus by applying power from the first power source to the drive motor; and

moving the translating jaw into engagement with the rotating jaw for, locking the shaft against rotation about the axis.

22. The method of claim 21 further comprising moving the translating jaw out of engagement with the rotating jaw for unlocking the shaft and allowing rotation of the shaft about the axis.

23. The method of claim 21 further comprising moving the translating jaw with a second drive motor having a power source independent from the first power source.

24. The method of claim 21 further comprising rotating the shaft of the drive motor through an additional angular distance after moving the translating jaw into engagement with the rotating jaw, to thereby ensure locking engagement of the rotating and translating jaws.

25. The method of claim 21 further comprising removing power from the drive motor after moving the translating jaw into engagement with the rotating jaw of the jaw-tooth clutch.